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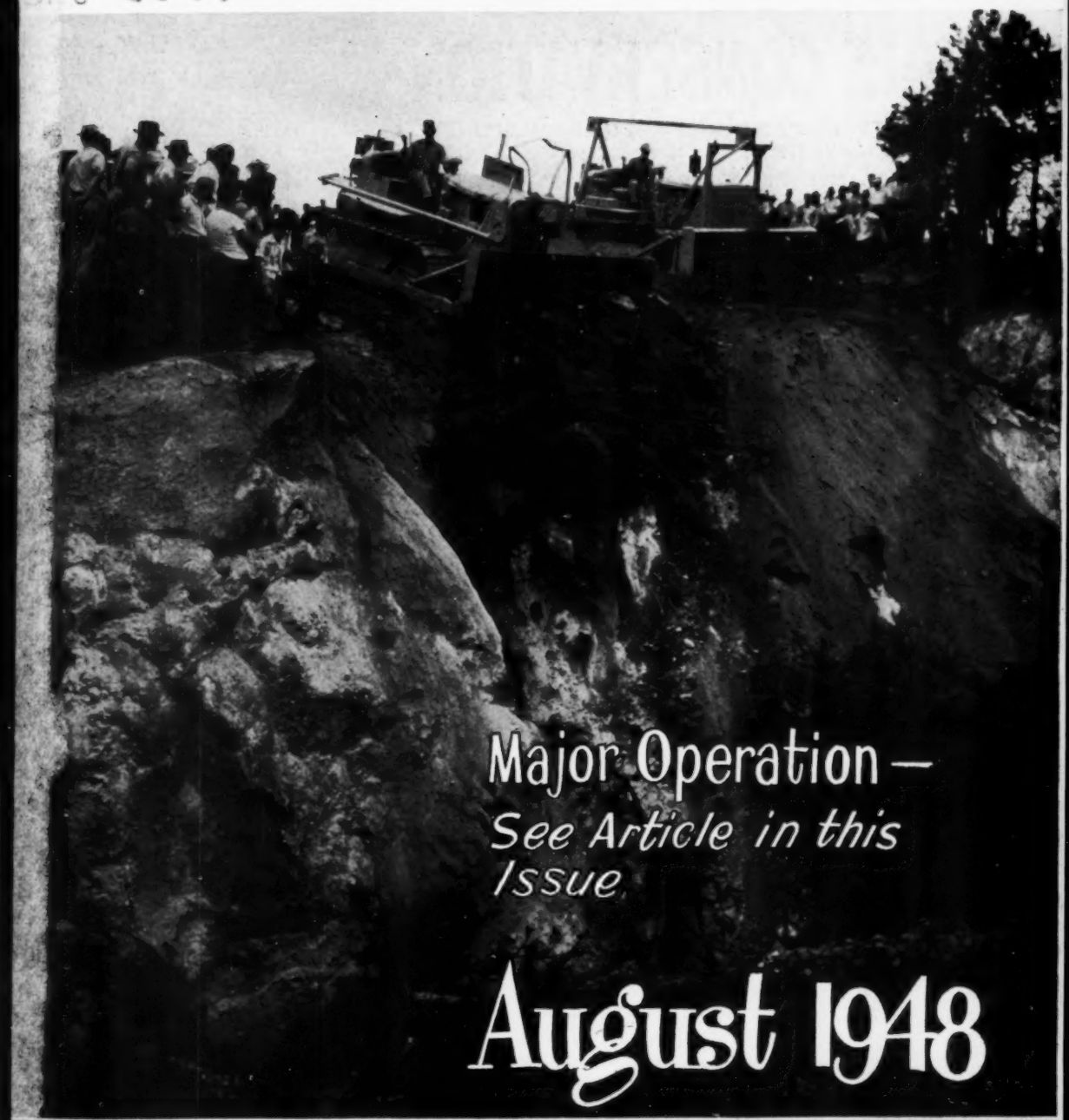

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WELLINGTON BRINK
Editor
Art Work by
W. HOWARD MARTIN

SOIL CONSERVATION is published by direction of the Secretary of Agriculture as administrative information required for proper transaction of the public business, with approval of the Director of the Budget. SOIL CONSERVATION supplies information for workers of the Department of Agriculture and others engaged in soil conservation.

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WE GET AROUND.—The extent to which SOIL CONSERVATION Magazine has become a world traveler is indicated by the 420-odd paid subscriptions from foreign countries. Subscribers outside the United States pay more than those inside our borders, but the number keeps growing. Scientists, teachers, and government offices predominate.

Among the addresses are Afghanistan, Algeria, Argentina, Australia, Belgian Congo, Belgium, Brazil, Bulgaria, Burma, Canada, Chile, China, Colombia, Costa Rica, Cuba, Czechoslovakia, Denmark, Dominican Republic, Egypt, England, Ethiopia, Finland, France, French Indo-China, French West Africa, Greece, Guatemala, Haiti, Hawaii, Holland, Hungary, Iceland, India, Iran, Iraq, Italy, Kenya, Lebanon, Liberia, Luanda Angolia, Mexico, Morocco, Mozambique, Netherlands, Newfoundland, New Zealand, Nigeria, Northern Rhodesia, Norway, Pakistan, Peru, Philippines, Poland, Puerto Rico, Rumania, Russia, Saudi Arabia, Siam, South Rhodesia, Spain, Sudan Africa, Sweden, Switzerland, Syria, Tasmania, Trinidad, Tunisia, Turkey, Union of South Africa, Venezuela, Virgin Islands, West Indies, Yugoslavia.

THE COVER.—This great canyon on the Carlyle-Blakey farm in Georgia disappeared on May 12. It took giant power to do the job. Behind the power of machine was the power of planning and good technique. Thousands of conservation-minded citizens watched with awe as a whole farm was remodeled along conservation lines between dawn and dusk. The story of this modern miracle is well told in text and pictures, beginning on the page opposite. (Photographs by Hermann Postlethwaite.)

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The huge crowd was widely scattered. A small part of it watched the making of this farm pond.

RECORD CROWD SEES BIRTH of NEW FARM

By BARRINGTON KING

SIXTY THOUSAND people saw an old farm take on the new look down in the Oconee River Soil Conservation District in Georgia.

It was the biggest of a long series of farm "face liftings" that have been held throughout the country. Six months of planning preceded the smooth-running demonstration. More than a million dollars' worth of farm equipment was in operation. Seven hundred persons, including machine operators and 300 GI agriculture trainees, helped with the various jobs.

NOTE.—The author is chief, regional information division, Soil Conservation Service, Spartanburg, S. C.

Probably the only thing that hadn't been anticipated by those who put on the show was the size of the crowd. Parking space had been optimistically provided for 14,000 cars, but the space soon filled up and the cars overflowed to adjoining areas.

The Georgia highway patrol checked 15,000 cars moving bumper to bumper up to 1 p. m. on the designated route from nearby Winder, Ga. It was estimated that 1,000 additional cars came in by the back way over a dirt road. At four people to a car, that would have exceeded the generally accepted figure of 60,000 visitors.

Probably most of the people who visited the Carlyle-Blakey farm on May 12 felt as Carlyle did

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when he looked out over the milling throng and the hundreds of pieces of farm equipment at work on their assigned jobs:

"I thought it was going to be big, but I didn't expect anything like this."

Operations continued without let-up through the lunch hour and speaking program that followed on top of a hill overlooking the farm. Chief H. H. Bennett of the Soil Conservation Service, one of the feature speakers, compared the operations going on around them with the building of the pyramids. This work was more important he thought.

"The pyramids were built to commemorate the dead. What we are doing here today is seeing a vision of the future," he said. "Twenty-five or thirty treatments are being applied here according to the needs and capabilities of the land. We can't afford to lose any more of our diminishing supply of good land that is needed to feed an increasing population."

Congressman John Wood of the Ninth Georgia District, who took time off from his duties in Washington to fly down for the event, said he considered it "one of the greatest milestones of agricultural progress in this part of the United States." He conveyed Senator Richard B. Russell's regrets that he could not be present and pledged their efforts in the continuation and development of a sound conservation program.

Gov. M. E. Thompson compared the demonstration with the pioneer cooperation in building the Nation. He expressed the gratitude of the people of Georgia to the *Atlanta Journal*, which was cosponsor with the district supervisors and the Winder Civic Clubs, and to the Soil Conservation Service for making the event possible. He pointed out the opportunity for soil conservation district assistance which is now available in all but three counties in the State.

Wright Bryant, editor of the *Atlanta Journal*, said his newspaper and all of its staff were proud of their part in promoting the event, but that "without the help of the Soil Conservation Service, the civic clubs, farm implement people, and others, it would not have been possible." He pointed out that no farmer could duplicate what was being done there, but that thousands of farmers were seeing, within a few hours, results they could accomplish over a period of years.

It was left to the Reverend E. H. Collins, who presided at the speaking program, to explain why the threatening rain that might have marred the day had not materialized. The chaplain of the Georgia Association of Soil Conservation Districts told the crowd that he had been praying for this and had told sponsors six weeks before that the weather would be good. A light drizzle during the morning had served only to lay the dust and moderate the heat.

W. H. Holsenbeck, chairman of the Oconee River Soil Conservation District, introduced the special guests. Bert D. Robinson, cooperative conservationist, assigned by the State office of the Soil Conservation Service to assist the supervisors in promoting the event, and Harvey Johnson, assistant state conservationist, were commentators on the various phases of the program.

By early afternoon, the 168-acre farm of Marion H. Carlyle and his GI nephew, Ernest C. Blakey, was beginning to undergo a tremendous transformation. Wherever visitors looked, heavy and light tractors, road patrols, terracing machines, land clearers, subsoilers, and cultipackers were busily engaged in their assigned duties of remaking portions of the farm under direction of SCS technicians.

Bulldozers that cleared land for pasture were followed by fertilizer distributors, lime spreaders, and seeders. Earth scooped out of a little valley and built into a dam was soon backing up water in a 2-acre fish pond that was partially stocked with fish during the afternoon. A yawning 50-foot gully had completely disappeared before the day was done.

Winding terraces began to appear in cultivated fields, meadow strips were shaped and seeded, land was prepared for alfalfa and rotated crops, woodland areas were thinned, steep land was planted to kudzu and sericea, new wire stretched between new cedar posts glistened in the sunlight. A new metal barn had been erected and the farmhouses had a fresh coat of paint.

District Conservationist R. L. Dolvin, who supervised planning and directed technical operations, thinks the most significant comment on the entire demonstration was an unwitting compliment paid by one of the visitors. Looking out over the beehive of activity on the 168-acre farm the visitor said to Dolvin, "You know, it's really remarkable how something as big as this can run so smoothly without any supervision."

It was a tremendous undertaking—this remaking of an eroded farm in a single day. It required a lot of planning, working, and cooperating on the

Upper left, panoramic view of part of farm on historic day of transformation. Upper right, Chief Hugh Hammond Bennett hands out hard facts from speaker's stand. Lower left, onlookers edge serpentine gully as the big trees begin to fall and filling operations get under way. Lower right, selective cutting in the modern mode.

part of everyone. But for the 60,000 visitors who went away with a new conception of the possibilities of conserving their irreplaceable soil resources, its benefits will go on for many years to come.

CROP RESIDUES.—Farming methods designed to leave on the soil surface a considerable portion of the residues from preceding summer or winter crops, as a mulch during the growth of row crops or small grains, have been proved agronomically feasible and practicable for the Piedmont soil provinces, according to T. C. Peele, SCS Research, Clemson College, S. C. Maintaining crop residues on the soil surface is a much more effective method of reducing run-off and erosion from areas where corn or small grains are growing than plowing the residues under and using conventional clean-tillage practices. Also, short-time trends indicate that the mulch-farming practices cause greater improvement in soil aggregation and a more rapid increase in soil organic matter and nitrogen in the 0- to 5-inch soil depth than conventional methods.

ROUND-ABOUT VICTORS.—How much does contour planting and cultivation add to the yield of corn? The answer might be found in an analysis of the records of the Kentucky Corn Derby.

In the one-acre group the 82 entrants who planted and cultivated their "sloping upland" on the contour had an average yield of 94.3 bushels. The 181 farmers who planted their "sloping upland" with the conventional straight rows averaged 79.3 bushels.

In the 5-acre group the "contourers" averaged 90.2 bushels while the "straight rowers" made 86.9 bushels.

The top prize for the 5-acre group went to Charles Gray of Fleming County who produced 136 bushels per acre on a 15 percent slope which was planted and cultivated on the contour. Harve McBrayer, Rowan County, winner in the 1-acre group on contouring produced 163 bushels on an 11 percent slope which had also been terraced.

The benefits of contour cultivation are not confined to increased yields. One custom operator in Nelson County gives a discount for working sloping land on the contour because it requires less fuel to work " on the level."

9 MILLION TREES FOR HAY CREEK WATERSHED

THE PEOPLE OF RED WING and of the Hay Creek valley in Goodhue County, Minn., have taken the first step to halt the terrific erosion and the floods which have beeen damaging farmland, city property, roads, and railroads.

In 1 day last spring 30 crews totaling 327 persons planted 62,000 trees on 26 farms in the Hay Creek watershed. It was Hay Creek Valley Arbor Day and everyone turned out—farmers, businessmen, 145 high school seniors, and 40 boys from the State training school. Merchants gave employees time off, with pay, to help out. Stores closed at noon. The Chicago Great Western Railroad furnished a section gang and the Chicago, Northwestern Railroad supplied a tree-planting machine.

The work was hard and the sun was hot. There were no rewards or prizes, except knowledge of a job well done.

Our story starts long before last spring, many years ago when the farm land was new and comparatively unscarred. Erosion went unnoticed for quite a while. Hay Creek then turned the wheels of half a dozen flour and feed mills, not a trace of which remains today. Tons of sand mark the spots where some of them stood. There are now few stretches of stream where a self-respecting boy, much less a trout, would swim.

Hay Creek has averaged two floods a year. Roads covered, bridges washed away, rich bottomland buried under unproductive subsoil or debris from up above. Gullies have sliced through many of the fields. Ten years ago a bridge near town had a 14-foot clearance; today a fat man couldn't crawl under it. The railroad that runs through the valley has had to be raised at several locations and United States Highway 61 is being relocated. After every flood a tannery at the creek's mouth, one of Red Wing's leading industries, has to dig a new 900-foot drainage channel.

In 1944, after watching the situation grow steadily worse, the city council, the Goodhue County Board, and the East Goodhue Soil Conservation District asked the Soil Conservation Service to make a survey and offer a solution.

In August 1947, as a result of Service recommendations, local government officials, businessmen, and farmers organized the Hay Creek Watershed Committee. Working hand-in-hand with the soil conservation districts, this committee formulated what is known as a "group enterprise project." It has three major phases:

1. A community forest on land not suited to agricultural use. Eventually this will put 7,000 acres in timber to be used for public park, wildlife refuge, and timber-production purposes. About 115 farms will have to be abandoned for crop production. Some of them will furnish homesites and there will be some land that can be used for small fruits and orchards but the kind of farming that has practically ruined this land will stop. It will go into trees for its own good and the good of the community.

2. Complete farm conservation plans on 150 farms, totaling about 20,500 acres. Even here trees will have an important role. Seventy-five of these farmers are already putting conservation plans into effect.

3. Bank and grade stabilization structures on 13 tributaries of Hay Creek, and stabilization of 3 miles of lower channel. The local watershed committee is now working on a plan for doing this. Estimated cost, about $225,000.

The community of Red Wing and the East Goodhue Soil Conservation District have their work cut out for them. Eventually 9 million trees are to be planted. First step was the community tree-planting on Hay Creek Arbor Day.

The crews worked under foremen trained by SCS personnel. They'll be on the job again when another planting season rolls around. Farmers and landowners bought the trees at cost from the State Conservation Department under a State law which authorizes such sales for conservation plantings. They were willing and able to pay for the trees but would have been short of labor, except for the volunteer help that was provided. The varieties were mostly Norway pine, jack pine, white pine, and white spruce.

The chamber of commerce, farm organizations, civic clubs, schools, railroads, churches, and other groups and many individuals cooperated in the event. Lee K. Moore, district conservationist, and A. J. Kunau, county agent, were general managers. Julius Kubier, Grenfall Harms, David P. Shea, and the SCS staff in the district, and Dean Turner, veterans' agricultural instructor, gave much time and energy to planning the event, training foremen, and helping with the supervision.

It's Always Fair Weather

"The weather has been very favorable for small grain and pastures."

By McLEMORE ROBERTS

HOW TO OUTFIGURE the weather is often said to be the farmer's hardest job. But if he is following a complete soil and water conservation program on his farm he is ready for the weather, whatever it may be. Also, the Soil Conservation Service technician assisting a district will always have jobs on which to work, no matter what the weather may be.

I reached these conclusions after reading the March 1948 reports of district conservationists in the zone in which I work. This zone is mostly Coastal Plain country in portions of Alabama, Mississippi, and Florida. March was unseasonably cold and wet in most of the zone, and the district conservationists did a lot of talking about the weather in their reports. They went like this:

J. J. Stroup, at Anniston, Ala., said, ". . . the weather was far from being ideal for field work."

A. A. Sheppard, at Tuskegee, Ala., reported, "Unfavorable weather conditions have greatly retarded spring preparation of land."

NOTE.—The author is zone conservationist, Soil Conservation Service, Spartanburg, S. C.

"Sericea planting has been under way, but the rain has held it up," according to T. G. Amason, in the Wiregrass Soil Conservation District.

W. T. McKell at Brookhaven, Miss., said dry (!) weather interfered with planning because his men were kept busy helping farmers apply soil conservation to the land.

In the Black Belt of Alabama both Carl Morgan and W. H. Tucker said, "Weather conditions continue unfavorable. . . ."

H. C. Appleton, Dadeville, Ala., aptly summarized: "It may well be said that weather conditions for the first quarter of this year have, in one way or another, been unfavorable."

Now listen to how well farmers and Service technicians outfigured the same weather. Truly it's an ill wind that blows nobody good.

From Stroup's report: "The weather has been very favorable for small grain and pastures."

Sheppard: ". . . tremendous growth of winter legumes and small grain in the last 30 days."

Amason reported success with reseeding crimson clover. Several reports show crimson clover, Caley peas, oats, and other crops being benefited by the weather.

All who mentioned blue lupine reported cold

damage. This year's weather was generally unfavorable for lupine, but very favorable for oats and other winter-hardy crops. A year or two ago during a warm winter oats looked sick, while lupine "rang the bell."

Now let's see how the Service technicians adapted their activities to weather conditions.

Henry Bending, Laurel, Miss., who reported "ground too wet for digging kudzu" also reported 750,000 kudzu plants set out. Those plants were dug somehow. Also, "between showers," technicians surveyed terrace lines and farmers built 100 miles of terraces during March.

C. T. Prout reported that technicians assisting Mobile River Soil Conservation District arranged for woodland demonstrations in Mobile, Clarke, and Choctaw Counties, and broad-base terrace demonstrations in the same counties, plus Washington.

Stroup again: "Over 250,000 kudzu seedlings were planted, 130,000 produced locally." In this district 39 farms were planned. Also, some sort of activity on somebody's part resulted in "52 additional applications, making a total of 254 on hand"—enough for nearly 6 months of planning.

Malcolm Croft, Conecuh River Soil Conservation District, reported, "Weather unfavorable," then his next sentence stated, "Sericea and kudzu planting has almost been completed." This group assisted in planning 47 farms in March.

In Greene County, in W. H. Tucker's work group, 280 tons of phosphate and 100 tons of lime were spread on pastures.

In the Piedmont District H. C. Appleton reported extensive dragline operations being carried on during weather that "has in one way or another been unfavorable."

Dewey Morris, S. J. Dedeaux, Carl Morgan, and Bert Karick also reported similar progress, and could have been quoted. All of these reports add up to this fact:

Weather conditions that are unfavorable for one type of activity are favorable for another in a well-rounded soil conservation program.

"Between showers SCS technicians surveyed terrace lines."

INSECT NEEDS AND SOIL FERTILITY

By LEONARD HASEMAN

We at the Missouri Agricultural Experiment Station for a number of years have been interested in studying the influence of plant nutrients on the well-being of insect pests when they are reared on crops grown on varying levels of the different soil minerals. The work of various investigators in human and livestock nutrition have shown that the higher animals generally require a ration well balanced as to minerals and growth-producing elements. Insects are animals and in many ways conform closely in activities and life processes to those of the higher animals, so we naturally expected when we began these investigations to find insects also requiring well-balanced rations comparable to man, for instance. We were surprised, therefore, to find that some of our more common crop pests do not choose or require what we consider as balanced rations, like other animals, but on the contrary they very definitely thrive better on crops grown on unbalanced mineral levels.[1] Finding this to be true with some of our test insects, we have asked ourselves why should a cow, for instance, thrive better on, in fact require for normal development, say, corn fodder grown on soil charged with adequate supplies of the different essential soil minerals, while the chinch bug prefers and does better on corn stunted due to a shortage of nitrogen?

Until someone finds that we are wrong, we shall assume that with their millions of years of experience here on the globe, insects have become so adaptive, not only as to their environments but also as to their specific nutritional requirement, that at least some of them are actually able to thrive better on crops or other foods so low in certain minerals or food elements that when such foods are consumed by man or livestock they may actually cause "hidden hunger" and nutritional deficiency diseases. In other words, *as we deplete soil fertility we seem to be making conditions more favorable for growing stunted crops highly favorable as food for our insect enemies, but increasingly unsuited for man and livestock.* That is exactly what we are doing in case of the chinch bug, and the handwriting on the wall strongly indicates that similar developments are taking place in the case of grasshoppers and other major crop pests.

True, each insect species will probably be found to have its own specific nutritional requirements and they will, therefore, not all respond in the same way to a variation in the levels of the same soil minerals. Some insects require a low nitrogenous and proteinaceous diet and a high carbohydrate diet, as in case of the chinch bug, while the reverse is true of other species. Before we entomologists, therefore, can use fertilizers to best advantage against insect pests we shall first have to learn more about the dietary requirements of each major pest. Crops and soils specialists test the soil and then recommend a fertilizer which will help correct the mineral shortages and this works fine for improving crop production. *We entomologists, on the other hand, should go farther and try to learn how to vary the formula of the fertilizer so as not only to increase crop production but also to make the crop less satisfactory as food for insects and more nutritious for man and beast.*

Attacking insects through the soil with fertilizers is not new, but a full understanding of just how varying levels of soil minerals, and combinations of those minerals operate in making crops less favorable for our various crop scourges, still remains to be worked out. A number of splendid pieces of research have been completed in recent years which, while not bearing directly on this problem, do include data to support the theory that by slightly varying chemical or mineral composition of an insect's food we may greatly influence normal growth, development and reproduction. Among others, I would mention Roscoe E. Hill's study of the Tuber Flea Beetle in Nebraska in Research Bulletin 143, and Charles H. Brett's studies on the Lesser Migratory Grasshopper in Oklahoma Technical Bulletin J–26. It is common knowledge that certain insect pests tend to thrive and multiply faster on undernourished and stunted crops and in weakened trees, for instance, as borers and bark beetles, and during drought years when plants generally, including even forest trees, are less able to draw up their normal quotas of soil minerals. When we stop to consider that such insects as the chinch bug

[1] In our studies on the greenhouse thrips we found that they definitely chose New Zealand spinach plants low in calcium and nitrogen but incidentally high in oxalate and Vitamin C.

Note.—The author is chairman, Department of Entomology, University of Missouri, Columbia, Mo.

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thrive better in drought periods when its food crops are low in nitrogen, in fact when all vegetation is short of the essential human health-building soil minerals, Shelford's finding of "A Striking Correlation Between Human Death Rate and Chinch Bug Damage," in the early history of chinch bug outbreaks in Illinois, is but the natural thing to expect. If, as in the case of the chinch bug, we find that insect pests generally have adjusted their dietary needs to unbalanced or low levels of certain soil minerals, which obtains in case of crops grown on soils depleted of their fertility, then we entomologists should more seriously consider the opportunity we have to fight these pests with properly compounded chemical fertilizers.

Useful, ornate, and made from "waste" woods.

WASTEFUL HABITS

By HUGH BENNETT

TRADITION and habit have played a large part in bringing about our characteristic American ways in the lavish use of our natural resources. Many of the early American settlers came from European areas of gentle, nonerosive rains and knew little or nothing of man-made erosion. Moreover, they thought our original store of good land, minerals, timber, and wildlife were limitless and inexhaustible. I think my father, who was born in 1833, felt that we would never be able to use all of our productive land here in America, although he understood something of the impoverishing effects of erosion.

We undoubtedly hold the world's record for waste. Take our land as an example: We started out with more good land, probably, than any other nation was ever blessed with; but we have allowed erosion to ruin around a hundred million acres of formerly good cropland for any immediate practical cultivation, and then have followed that up with moderate to serious damage on a second hundred million acres.

And most of us have gotten into the habit of burning or throwing away everything for which we find no immediate use. To a considerable degree, this has been forced on us. Accumulating piles of immediately unneeded items develop eyesores and harboring places for rats, we have felt. With many, storing facilities are not available.

Probably this wastage of all sorts of things is due mainly to two things: (1) In our economy it often costs more to find a market and deliver such things as waste paper and scrap iron than we get for them, and (2) we just haven't taken time out to develop economic outlets or markets for the thousands of things we either have to throw away or find it easier and less expensive to discard than to save.

During World War II, at a time when we desperately needed more timber than was available, I noticed around Christmastime that great quantities of wooden boxes and crating were being hauled away by truckloads from busy market places in a number of cities. Looking into what disposition was being made of this once-used lumber, still in good condition, it was found that almost all of it was being hauled to the city dump for burning.

Then, during the widespread discussion of how we had perilously cut into our supplies of critical metals to meet the demands of war, I ran into a situation on tin that was a big surprise to me. We have no tin of any importance in the United States—import it from Bolivia and other places. Tin is so scarce, I have been told, that some people call it a precious metal.

Well, last year when I went over to the store to buy a crate of summer tonic, the bottles had to be returned: No bottles, no tonic. But when I bought the tonic in cans and took the empty cans back, they were not wanted. "Nobody wants tin cans; throw 'em away," I was told.

The point is: Bottles are made of the most abundant element of the lithosphere, one that occurs everywhere, right on the surface of the ground. But glass is wanted, not tin—which is one of the rare elements! Probably it would be "too expensive" to recover the small amount of tin used in making an ordinary "tin can." However, it holds a highly important place among the elements of the earth. This may give some idea of why cost of production rates so highly among the people of the earth.

Cost of production is very important, as a matter of course; we can't get away from it. Don't need to. But we do need to learn how to save scarce things.

I started to write something about utilizing odd items of wood that so commonly find their way to the scrap heap. We are probably going to have to do a lot of educating in order to get anywhere with the development of any national habits of thrift in the sense I am using it here. The real work of education will have to be done in school, all the way from first grade classes in thrift on to graduation from college. That doesn't mean, however, that a few suggestions can't be thrown in for benefit of conservationists.

I should like, by way of my suggestions, to mention a few things that can be made from wasted woods. One is an exquisite small table that W. H. Lathrop of the Soil Conservation Service made for me during spare time off duty. The top of this little table was made from a burl taken from boxelder, a wood that usually is considered worthless—not even considered good for firewood. Yet Lathrop turned it into a table top having the luster and mottling of fine marble.

Let me quote from the builder something about the construction of this useful piece of furniture. I had requested some of our men having skilled hands with wood and a sense of the beauty in grain and pattern to make for my use a small table suitable for illustrating the point: Conservation of wood.

Left to right: wild cherry, maple, black locust, chestnut, mahogany, mesquite.

Lathrop describes the wood from which the center part of the table was made as an up-tree boxelder burl. "It was sliced into standard furniture veneer, using a half-round cut. I found this tree on a busy street here in Milwaukee, where hundreds passed it daily with no thought of the beauty hidden beneath its rough, warty bark.

"Ash, elm, cherry, oak, and other trees produce burl, but there is no regular demand for the small supply.

"Usually the greatest beauty of figured woods is the striped effect revealed by quarter cutting, but in working up very small logs flat figures will show about as much as the quarter figure."

The honey locust used in the aprons of the table had a crotch in the log that produced a very pretty fountain-figure effect when worked up by a tangent cut. It is the highly figured portions of odd pieces of wood that are often wasted. Stumps that yield those beautiful chain-link effects are left in the ground. Crotches that cut up to show a "lovely fountain figure are impossible to split, so they usually go onto the waste pile." It appears that some trees which grow on poor land are most likely to have highly figured wood. The struggle for existence, somehow, tends to produce such characteristics in tree growth. The poor lands occurring on the flat plains near the mouth of the Jobabo River in south-central Cuba have the reputation of producing beautiful birdseye mahogany, highly valuable for the manufacture of furniture. The growth of mahogany in this locality is exceedingly slow.

I have in my collection of wood products such items as: A set of goblets made from farm waste pieces: (1) wild cherry, (2) maple, (3) black locust from Thomas Jefferson's farm in Albemarle County, Va. (Pantops), (4) chestnut from Peter Jefferson's farm in Albemarle County, Va., (5) wine bottle, mahogany, and (6) box made of Texas mesquite. Also, I have small slabs of wood from most of our American-grown fruit trees, bois d'arc, ailanthus, sumac, and many other trees, and zapote, silicious palm, cedro real, cedro macho, laurel (mareño), balsa, and many others—all waste pieces. What I don't have are hands that can fashion useful things out of wood.

1. Hardgrave and Charles Van Gorder, unit conservationist, plan practices.

2. Winfred G. Glover, SCS engineer, "running lines."

3. At early dawn comes the roar of scores of tractors pulling many types of farm machinery.

4. The Verde River, which provides water for irrigation, also poses a serious problem: streambank erosion. Bob studies how to keep more acres from riding away.

5. Huge bulldozer in action. New channel is dug, river's course changed. Trees are cut and lashed against the bank by heavy cables; hundreds of small trees are planted for growth into a natural barrier against the knifing current.

6. Large and small machines of many types busy themselves constructing bench terraces, leveling and plowing fields, digging irrigation ditches.

REMADE IN A DAY

7. General view of progress around noon.

8. But there's no let-up. Cottonwood Civic Club serves sandwiches and drinks from booths near farmhouse.

9. Danny Freeman, district conservationist in Yavapai County, gives instructions as ditching machine rips trench for irrigation pipe-line.

10. Cottonwood High School boys lend a hand at laying irrigation pipe.

11, 12, 13. Bulldozers labor at construction of large storage reservoir which will save time and labor in irrigating. The pond will provide fishing and other recreation for the Hardgraves and their friends.

(Article begins next page)

By VIRGIL S. BECK

LOCATED on the picturesque Verde River near Cottonwood, Ariz., is the 35-acre farm of Robert C. Hardgrave, 36-year-old disabled war veteran, which was completely remade between dawn and dusk one day in April in the first face-lifting job of this type ever staged on irrigated land.

The idea of remaking a farm in a day was not new for several such events had been staged in the humid areas of the Upper Mississippi Basin within recent years. However, a face-lifting job on an *irrigated* farm involved much more intensive planning and detailed engineering work.

Nevertheless, the supervisors of the three Verde Valley soil conservation districts—Oak Creek, Bridgeport, and Camp Verde—and John D. Freeman, district conservationist for the Soil Conservation Service in this area, believed the job *could* be done in a single day. They started looking for a suitable farm and soon agreed on Bob Hardgrave's—the most farmed-out, run-down, depleted place in the entire valley, one which challenged the ingenuity of the soil conservationists.

Bob Hardgrave, an ardent believer in soil and water conservation, readily agreed to the idea when the district supervisors explained that this would provide a means for acquainting a large number of persons with the importance of soil and water conservation and with methods best suited to agriculture on valley land in Arizona and similar areas.

The community liked the idea and gave their hearty cooperation. Interest spread over Arizona and beyond. Seventy-three manufacturers and dealers in tractors and farm equipment agreed to donate the use of their machines, and the farm face-lifting job developed into one of the largest farm machinery demonstrations in the history of the Southwest. Contractors offered to donate the use of their equipment. Supply houses would furnish needed materials. Farmers, laborers, high school youths, and Boy Scouts volunteered labor.

Many long hours were spent by District Conservationist Freeman and his staff on planning. Carloads of farm equipment and materials were shipped into the area from as far away as 800 miles. The stage was set.

As dawn crept over Verde Valley that April morning, the spring quietude was broken by the roar of more than 50 tractors as various types of machinery began moving over the fields. An estimated crowd of more than 4,000 came to view this mass application of conservation practices under ideal weather conditions. In addition to farmers from every section of Arizona, there were visitors from Colorado, New Mexico, Ohio, New York, Texas, Oklahoma, Kansas, Utah, and California.

Each man and boy in the volunteer work groups knew every detail of his job because of long and tedious briefing by Freeman, his staff, and the district supervisors. A lone woman tractor operator attracted attention as she did a masterful job of land leveling.

Farmers and business people, men and women, watched in awe throughout the day as they saw the severely eroded Hardgrave place converted into a model farm. They saw every suitable type of farm machinery, large and small, level and construct bench terraces. They saw irrigation ditches dug. The crowd was amazed as a machine spread a water-saving concrete lining in 600 feet of ditch within 20 minutes. Another ditch was lined with concrete by means of a spray gun, and a third was oil-lined.

The crowd cheered as a giant bulldozer moved mountains of earth in constructing a large storage reservoir, which will save time and labor in irrigating, and provide fish and recreation. Amazement gripped the spectators as this same huge bull-

(*Continued on page 16*)

14 and 15. Around 600 feet of lateral irrigation ditch is lined in 20 minutes with this machine. Such ditches save water and make irrigation more efficient.

16. Another way to line a ditch is by the pressure spray gun.

17. Irrigation ditches completed, and bench terracing and land leveling nearing an end.

18. Posthole digger speeds erection of new fences.

19. Small farm equipment also has its role. This midget machine plows the garden site.

20. John D. Freeman, in charge, looks over the scene as dusk settles over valley. It has been one of the busiest days in Danny's life, and he has the satisfaction of knowing that detailed and tedious planning has helped to convert a run-down, non-productive farm into a model of soil and water conservation.

21. The Hardgraves name their farm "Mizpah Ranch." Bob and Zillah (with older son Bill) nail the sign on the gate at the end of day.

NOTE.—The author is head of the current information section, Albuquerque, N. Mex.

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(*Continued from page 14*)

dozer literally changed the course of the Verde River. A streambank protection system was installed along the area where erosion already had taken several acres of the best land.

The spectators saw just about everything done that is needed on an irrigated farm, such as plowing and floating of fields, installation of concrete and corrugated iron pipes and irrigation structures. They saw demonstrations of post-hole diggers, a mechanical trencher, a sprinkler irrigation system, siphons, and so on.

The Reverend Henry R. Buhler, pastor of the Verde Baptist Church which the Hardgraves attend, applied a coat of paint to house and barn. The paint had been donated by a manufacturer, and the minister volunteered to do the work as his contribution. A garden site was prepared, an orchard was planted, and roses and other flowers were set out around the home site.

Bob Hardgrave, who had spent 5½ years in the army and many long months in hospitals, saw his dream come true—an ideal farm for himself, his wife, Zillah, and their three children. After Bob had sufficiently recovered from his wounds suffered at Metz, he decided that he wanted a good farm. However, he found that he could not afford to buy the kind he wanted, so had to be content with the old depleted land which he purchased on a GI loan at the inflated price of $10,000.

Hardgrave had hopes of eventually getting his land into profitable production, but he knew it would mean a long, hard struggle. Therefore, when the soil conservation district supervisors suggested to him that his farm be remade in a day, he didn't hesitate in approving. Now, work has been done which probably would have taken Hardgrave 10 years to do alone, and would have cost $5,000 or more. The value of the farm already has been doubled and is expected to climb to from $30,000 to $50,000 within the next 5 to 10 years as full benefits of the program are realized.

Hardgrave and his family are appreciative of what has been made possible for them. After the day's work was finished, the Reverend Buhler and the Reverend R. S. Beal, pastor of the First Baptist Church of Tucson, conducted an old-fashioned camp meeting in front of the farmhouse as a sort of "Thank you" service.

Bob and Zillah have named their farm. On the gate they have nailed a large sign, "Mizpah Ranch, Genesis, 31:49." This Biblical reference is: "Mizpah . . . The Lord watch between me and thee, when we are absent one from another."

NORTHEAST

CONVINCING EVIDENCE.—"I am a subscriber to the SOIL CONSERVATION Magazine and a cooperator in the Lancaster (Pa.) Soil Conservation District," writes Fred Appel. "We have a 30-acre farm on which we have a 4-year rotation of hay, corn, tobacco, and wheat. Besides this we raise several thousand broilers yearly.

"A little over a year ago, we called in SCS men to lay out contour strips. Although we had previously tried to prevent washing by getting a good sod, keeping grass in the ditches, and by other means, we have already seen a marked improvement as a result of the strips. It was a hard job to lay out the strips because the fields were so small and so irregular, but we feel it is going to be worth any extra effort required.

"Last summer in the strips planted to tobacco, one could see the cultivator furrows standing full of water for a while after a heavy rain, where previously the furrows would be washed out and the ground hard and dry. We knew then that we were storing up the rainfall, and that our fertilizer was not all going down the creek.

"Lancaster County is reputed to be the 'Garden Spot of America.' But I'm afraid the farmers here are too willing to rest on their laurels. One does not have to be too observant to see the signs written on the land all about him. While the SCS men are working so hard—and they are a fine bunch of fellows—there is much yet to be done. Farmers must be blind to let their soil slip away at such a rate. They need only to look at the farms where a conservation plan is being carried out to see convincing evidence of the results of proper methods.

"We are starting something here this year on which I would like your opinion. We were able to get a tractor and implements this spring to replace horses, so we intend to mow the hay strips and let the grass rot on the ground. Instead of letting it mature, we are going to mow it early so there will be two or three cuttings. Also we are going to scatter the straw after the wheat has been combined with the exception of the small amount we will need for a pair of hogs and about a hundred laying hens. Then we will use the manure from the broilers and apply fertilizer liberally to the corn, tobacco, and wheat. We figure this will pay better ultimately than selling the hay and straw or feeding steers or other cattle. What is your opinion of such a plan? Has it been tried elsewhere?"

EDITOR'S NOTE TO MR. APPEL.—I am just a little reluctant to offer an opinion concerning your new plan for mowing the hay and leaving the grass on the ground. From the conservation standpoint, there seems no question that you are on the right track. From the economic standpoint, however, there is just a little doubt in my mind. One of our research men tells me that if you were to mow the strips, save the hay, feed it and carefully preserve and return to the soil all of the manure, probably 70 percent of the value would go back into the soil in a readily available form. This certainly would be better than selling the hay. I note, however, that you seem to be engaged in poultry production rather than in the feeding of livestock. Your best course, I am quite sure, would be to talk the project over with W. Martin Muth, district conservationist, Quarryville, Pa.

SOUTHEAST

OUTSTANDING ACHIEVEMENT.—Wade B. Matheny, secretary of the Broad River Soil Conservation District supervisors, in North Carolina, recently was presented with the Forest City Kiwanis Club's achievement and citizenship cup. "Perhaps one of the greatest moves ever made in Rutherford County, insofar as agricultural conservation is concerned, was the creation of the Broad River Soil Conservation District in 1938."

GOOD TALK AND A LOT OF IT.—The 1948 Soil Conservation Speaking Contest, sponsored by the North Carolina Bankers Association was participated in by 4,328 contestants, representing 303 schools in 82 counties. Thirty-six radio addresses were made by competitors, 201 field trips were made, more than 404 news articles were printed. Total prizes (school, county, district, and final) amounted to $6,053.

UPPER MISSISSIPPI

SUBMARGINAL NO LONGER.—Eight years of progress in the Cedar Creek Forest and Pasture Project in Callaway and Boone Counties, Mo., started under the land utilization program, illustrate what improved land use and soil conservation can mean to a community once impoverished by too intensive farming.

The annual report of Cleo H. Statton, district conservationist at Fulton, states that the 12,839 acres of land in the project area are gradually being returned to productive use. All of this land had been in the submarginal class since the early 1920's, but it was not until January 1939, that the SCS launched its forest and pasture project.

About 1,233 acres of the area have been fully improved, and approximately that much more has been partially improved. The land that is suitable for pasture is being rented to farmers in that area, and a part of the revenue is turned over to the county in lieu of taxes that might normally come from the land if it were owned by private individuals.

Last year the Government paid Callaway County $821.06 in lieu of taxes, or approximately two-thirds of the taxes that would have been charged against the land. However, before the land was taken over by the Government, taxes on many farms in the area were delinquent and the farms came up regularly for sale at the delinquent tax sale each November.

There are five areas in Callaway which returned more money to the county than it would have realized if individuals had owned the land and paid taxes. These areas netted the county $300.92, as compared with a normal tax bill of $170.73.

In his report, Statton said: "Eighty-eight farmers living in the Cedar Creek Forest and Pasture Project received direct benefits in 1947 from the use of project lands. Their greatest benefits came from grazing livestock. Use of this land enabled these farmers to supplement their farm production and income. It was estimated that 246,970 pounds of beef were produced by this additional grazing. A total of 1,204 head of cattle were grazed for a total of 3,754 animal-unit months, in spite of the total grazing season not being up to normal.

"In addition to the cattle, 86 horses and mules were grazed for 209 animal-unit months. Thirty-one acres were used for cropland and 10 tons of hay harvested.

"Fifty-one percent of the grazing of 2,028 animal-unit months was obtained from 834 acres of land which had been limed and fertilized, and on which grasses and legumes were growing. Each acre produced grazing for one animal-unit for a 2.34-month period.

"On pastures where no development or improvement has been made, 2,262 acres furnished grazing for only 1,178 animal-unit months.

"In addition to the above uses of the Cedar Creek area, quite a number of farmers and townspeople have used the ponds for fishing. The ponds have not been fished heavy enough and too many of their catch are small. Sportsmen, using the area for hunting quail and rabbit, reported that the improved areas were as good or above average for the county.

"The agricultural economy in the Cedar Creek area has improved materially since the project was started. Farmers have not only improved the use of their land, but they have adopted many soil- and moisture-conservation practices. Continued improvement on the part of farmers in this area will reestablish a well-balanced system of livestock production."

POINTERS FOR MEETINGS.—What makes a good annual meeting of a soil conservation district? Some points which supervisors of some eastern Ohio districts obtained from cooperators and friends who attended their meetings—as reported by James W. Pendry, district conservationist at Lisbon, Ohio, are: short program with a good, but "not too serious," speaker; refreshments; neat, attractive, simple displays that tell a story; and plenty of advertising.

Displays included a large ownership map of the district with all cooperators' names. Many farmers saw for the first time that their neighbors were cooperators. Cooperators and friends gathered around the map to discuss plans on different farms. Several farmers applied to the district for assistance.

A "before" planning map, conservation survey and land-use capability map, and farm-plan map of the same farm in greatly enlarged form were displayed. The farm planner was there to answer questions. The maps were surrounded by pictures showing farm conditions. Labeled kodachrome slides projected on frosted glass showed scenes in the district. A demonstration on value of cover, using ink spilled on a blotter versus glazed surface, and soil samples taken from fence rows, compared with samples from fields, attracted considerable attention.

A display of bulletins available from the local Soil Conservation Service office, with a tablet for requests, brought good results.

After the meetings ended, many people were still looking at displays and discussing conservation.

HOW TO GET MORE WORK DONE.—Work-load analyses by SCS personnel and district directors in Michigan have proved effective in planning their program and developing a calendar of activities.

Some measures which the directors have decided to use to carry an increased work load include more rigid screening of applicants for technical help, calling applicants in for personal interviews at regular and special meetings, relisting applicants in accordance with urgency of need and degree of interest, getting more help from other agencies and cooperators in application of practices, and taking on more responsibility by directors and asking technicians to do fewer "chores" for them.

"MAKE EVERYONE CONSERVATION MINDED."—Many conservation activities have been carried out by Macomb Kiwanians under the leadership of their Agricultural Committee.

Early in 1947 the theme "Make Everyone Conservation Minded" was selected and agricultural leaders of the county were entertained at a regular meeting of the club. Invitations were sent to vocational agriculture instructors, 4–H leaders, representatives of the Soil Conservation Service, soil conservation district directors, veteran class instructors, and farm bureau directors.

Early in the summer, a dinner meeting was held at a rural church at Bardoph, Ill., to which prospective farmer leaders of conservation groups were invited. Each was seated near a Macomb club member who was prepared to talk soil conservation to his guest. The program included a panel discussion on "How to Get Conservation on the Land." Members of the panel included businessmen and farmers from the club, soil conservation district technicians, and two farmers who had completed soil conservation plans on their farms with the help of the East Lamoine Soil Conservation District. The panel discussion developed the idea that these farmer-guests could organize and lead groups for conservation planning in their *own* neighborhoods. Result was the organization of four planning groups with an average of 10 farmers in each group. Several other meetings were held with similar results.

During the year a conservation booklet was published and distributed to about 4,000 landowners and operators, and businessmen of McDonough County. The booklet contained local pictures, local accomplishments, and local plans.

Thus, the conservation activities of the Macomb club last year reached more than 4,000 people. Many Kiwanians who previously had little knowledge or interest in the program have become interested in soil conservation and 80 farmers in groups are working out farm conservation plans.

Macomb Kiwanians intend to continue the conservation activities of the past year and plan to add some new ones.—Hampton Long.

GIVE WILDLIFE A CHANCE.—A new form of recognition for farmers, emphasizing the place of wildlife in the farm conservation plan, was initiated this year by the Northwest Sportsmen's Show at Minneapolis, Minn.

The committee selected four Minnesota farmers who had done an outstanding job of soil and water conservation with special attention to wildlife. The farmers who were honored guests at the show for 3 days were Gilbert Goenner, Clear Lake, supervisor in Sherburne Soil Conservation District; Edwin Goplen, Zumbrota, chairman, South Goodhue Soil Conservation District; James Weideman, Sabin, Clay County Soil Conservation District; and Bert Hanson, Vernon Center. They received their awards at a dinner in March. Candidates for the awards were nominated by 30 Izaak Walton League chapters in Minnesota.

The winners have done an outstanding soil conservation job and have included wildlife management and protection in their plan. Most of them are active in sportsmen's groups and programs.

Goenner has devoted 60 acres of his 470-acre farm largely to wildlife. Since 1942, he has planted 6,000 trees for field shelter belts and wildlife cover and has protected 70 acres from burning and grazing. Planting rice in a duck pond, release of 50 pheasants, and planting of millet or cane for winter feed are among Goenner's other activities. He has been active in the Clear Lake Sportmen's Club and helped establish a fish pond on a neighboring farm.

Weideman has a 20-acre wildlife area, leaves some grain for birds, has done special wildlife feeding when 50 inches of snow covered the food patches, and is a member of the Moorhead Rod and Gun Club.

These men all farm so wildlife has a chance on their land and regard it as a crop to be perpetuated, enjoyed and used.

COST ANALYSIS.—To secure some information to present to the Vincennes Kiwanis Club, Lester Binnie, district conservationist at Vincennes, Ind., made an analysis of costs and returns for a conservation system on a 201-acre dairy and general farm in the Knox County Soil Conservation District.

The owner began his farm conservation plan in 1941 and all practices have been installed with the exception of one system of terraces and a tile drainage system of about one-half mile. The cost will average $12.50 per acre. He reports that he now is producing one-fourth more corn per acre, one-fifth more wheat, and one-half more hay and forage crops, and as a result his livestock enterprise is one-third greater than it could have been under the old system.

SOUTHWEST

DELEGATES TO VISIT DISTRICT.—More than 300 soil conservationists of the Americas are expected to attend an Inter-American Conference on Conservation of Renewable Natural Resources to be held in Denver in September.

The conference will consider conservation problems and recent technical developments in the conservation field. Among the problems discussed will be those arising from erosion, overgrazing, floods, failing water supplies, deforestation, and wildlife destruction.

The delegates will make a tour of the Cherry Creek Soil Conservation District. Also included will be a visit to the Walter Schubarth farm on which a complete soil and water conservation program has been established.

Another feature of interest to the conference will be the complete remaking of a farm in a single day in the Denver area.

PERPENDICULAR VIEW.—Practically every dry-land wheat farmer in the East Juab Soil Conservation District now has had a bird's-eye view of soil erosion on his land as a result of an aerial soil conservation tour staged at Nephi, Utah, last April.

This was the second such tour held in Utah recently through the cooperation of the Utah Flying Farmers and

soil conservation districts. The first air tour was held in the Northern Utah Soil Conservation District under adverse weather conditions, with more than 200 farmers viewing their land from the air.

The district supervisors cooperated with Wesley R. Dickerson of the Soil Conservation Service, and Delbert A. Fuhriman, president of the Utah Flying Farmers, in making this second tour a success.

Dickerson explained to the farmers that they could see vividly from the air the exact damage being done by erosion, how small gullies in tree-like fashion are cutting deeper and deeper and robbing their land of topsoil.

More than 30 Flying Farmers from all sections of the State brought their planes to the Nephi airport. The Nephi Flying Club provided a luncheon for the visiting fliers and farmers, and the East Juab Soil Conservation District furnished gasoline and oil for flights.

Before the start, motion pictures of soil erosion and remedial conservation practices were shown in the hangar, and conservation technicians told farmers what to look for. Practically every farmer in the district was taken on a flight, and then inspected a display of farm machinery set up near the airport.

HOME-GROWN SEED.—Reseeding is being done on 2,000 acres of abandoned cropland in the 15,000-acre Hawes and Thompson ranch in the Eastern Colfax Soil Conservation District, near Raton, N. Mex.

The abandoned cropland was a consequence of the fact that the ranch was made up of several old homesteads acquired by purchase. Much of it had been seeded to crested wheatgrass prior to the advent of the soil conservation program, but it had done badly because of adverse moisture conditions.

Another seeding of 500 acres with a mixture of crested wheatgrass and sweetclover was tried in 1945. A good stand was obtained on 120 acres, but the rest failed because of poor moisture conditions.

This 120-acre area was excluded from grazing in 1947, moisture conditions were favorable, and approximately 22,000 pounds of mixed crested wheatgrass and sweetclover seed were harvested.

The ranch owners retained the seed and last spring planted the mixture on 1,500 acres of the abandoned cropland on which reseeding operations had failed in 1944. With favorable conditions, the ranch owners expect to have practically all of the abandoned cropland back in grass production.

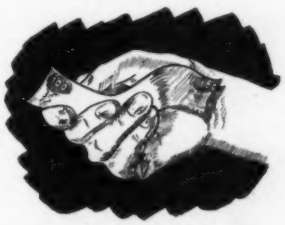
This illustrates, SCS technicians note, what can be done if farmers and ranchers will plant a small acreage to grass for seed production, and then use the seed to carry through a revegetation program.

SMOOTHED WAY TO BETTER YIELDS.—The moving of 316,000 cubic yards of earth in leveling 300 acres, and the elimination of a mile of irrigation ditch in the process, is an accomplishment of Allen Belluzi, chairman of the Roosevelt Soil Conservation District near Phoenix, Ariz.

The land was so rough that it could hardly be farmed, and Belluzi's cotton yields were small. SCS engineers planned the leveling job for Belluzi, and he employed an earth-moving contractor to do the actual work last fall.

Barley was planted on most of the leveled land. Although the seeding was very late, yield prospects now are so good that Belluzi feels certain that the crop will offset to a great extent his expenditures in putting the 300 acres into first-class condition. He says that when he can get more organic matter into the soil his yields will be still greater.

ANOTHER DEMONSTRATION.—Jules Vermeersch, supervisor of the New River Soil Conservation District near Phoenix, Ariz., has announced that a remaking-a-farm-in-a-day demonstration will be held in the Salt River Valley this fall. Vermeersch reports that he already has the pledges of farm equipment dealers to provide materials and the use of all necessary machinery, and that he expects at least 50,000 visitors.



CIVIC MINDED DISTRICT.—The San Juan County (Utah) Soil Conservation District recently donated $100 to a local hospital during a fund-raising campaign. The district has acquired pieces of equipment from time to time, and over a period of years has accumulated enough capital to make such a donation possible.

GOODEN LEVEL.—Soil conservation practices have solved two problems for R. G. Gooden on his 160-acre farm about 8 miles southeast of Artesia, N. Mex. They have more than doubled the cotton yield, and saved more than 50 percent on water for irrigating.

After Gooden became a cooperator of the Central Valley Soil Conservation District, he checked his 160 acres against an adjacent 80-acre farm. He found that his yield of a half bale of cotton per acre was only half the average of the 80-acre farm—and he was using four times the water.

He consulted SCS technicians assisting the district, and decided to carry out a complete soil and water conservation program. First, 14 acres of the steepest land were leveled into 43-foot benches. Drop structures and turnout boxes were installed to keep the main ditches from washing while turning water into the narrow benches.

In 1947, the first year following, Gooden harvested 1¼ bales per acre. This was more than double the previous yield, and water was saved, erosion was checked, and irrigating was easier.

Gooden was so well pleased that he has leveled an additional 105 acres. Even though the cost ran greater, Gooden leveled this land in much wider benches, 196 feet wide, because this will make farming easier. He figures that this increased expenditure soon will be offset by increased cotton yields.

Gooden still isn't through. He has arranged for completing the leveling job on his entire farm.

PASTURE PROGRAM.—Approximately 20 experimental irrigated pastures will be planted in Duchesne County in northeast Utah this year by cooperators of the Uintah Basin Soil Conservation District.

The district supervisors, sponsors of the project, announce that the purpose is to determine how best to establish an irrigated pasture to provide feed for two heavily producing dairy cows from one acre during grazing season.

DeWitt C. Grandy, SCS technician, recommends seeding mixtures of smooth brome grass, orchard grass, tall meadow oat grass, ladino clover, red clover, and ranger alfalfa.

Methods of preparing the seedbed, planting, and management during and after establishment are being stressed. A compact seedbed comparable to one for planting alfalfa is favored. Drilling is preferred. It is essential that the

planting be kept damp for the first three weeks after seeding, says Grandy.

Rotation grazing is advocated with at least two, and preferably three or more separate pastures. This will make it possible to keep cattle off pasture during irrigation and when the soil is wet. Mowing will be used for control of weeds and to encourage uniform grazing.

PACIFIC

FROM A 6TH GRADER.—"When *I* grow up, I intend to be a farmer. But if the soil keeps disappearing off the hilltops into the ocean and valleys, what would I and all the other young farmers have to look forward to?

"We will have deep gullies, with clay on the hilltops instead of soil. There will be rocks uncovered, deep holes, and dead trees with roots exposed. There will be dust swept deserts and deserted farm homes with dirt piled all around. All of these things and many others makes the future look gloomy for us.

"Now if I were Paul Bunyan, I would do something about it. I would harrow the land and take the rich soil and put it back on the hills where it belongs. But since I'm not, I think the present farmers should do the next best thing.

"In the first place, I think the farmers of today should have no more land than they can handle and take care of well. Too many farmers today, have too much land. They farm it for all they can get out of it and yet put nothing back into the soil. I think they should plant some of it in grasses. They should strip farm; they should plow around the hills, not up and down; and they should use the right kind of machinery for the kind of ground where they live.

"In some places they should dam small streams to hold the water so that it would not wash the soil. And if the summer was dry, the farmers could use it. There should be some kind of livestock on every farm and the pasture land should be changed *every* year.

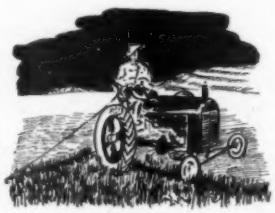
"Soil erosion is not new. In the book I got at Palouse on erosion, it said that soil erosion started as soon as the first winds began to blow and the first rain began to fall on the earth. Where vegetation is heavy, the erosion is slight, but where the land is bare and cultivated, the soil does not have any protection from winds and rain. This means gradual soil destruction or suicidal agriculture unless the use of land is changed.

"The Agriculture Department is doing all it can to save our soil, but the rest is up to the farmers.

"If I were a farmer now, I would do all I could do and I wouldn't be a hog of the land. I would want just enough land for a home and enough to carry out my plans and ideas for a permanent agriculture."—Mahlon Kreibel, 6th grade student, Garfield, Wash.

RESEARCH POINTERS

Prepared by J. H. Stallings



VEGETATED WATERWAYS.—Bermuda grass is superior to other grasses tested in protecting waterways from erosion, according to M. B. Cox and V. J. Palmer, SCS research, Stillwater, Okla. Bermuda grass provided more protection when clipped and maintained short than when allowed to grow tall and rank. Mowing produced a very dense, uniform cover that did not develop with the hay cover. Alfalfa, weeping lovegrass, and a native grass mixture were the least effective in preventing bad erosion.

ORGANIC MATTER.—Management of organic matter means management for the control of soil erosion by water and wind, of crop yields, soil structure benefits, irrigation, and water infiltration, is the opinion of T. M. McCalla, SCS research, Lincoln, Nebra. The soil should be conserved because it is the source of food now and for generations to come. It should be protected against erosion, leaching, and loss of fertility through cropping. This can be accomplished by following proved conservation and fertility practices. Manures and crop residues should be utilized to the fullest extent, along with other sound cropping and land management practices.

PLANNING AN IRRIGATED FARM.—A topographic map, which shows the location of the fields, streams and natural features and gives the elevation of all parts of the unit, is one of the most important assets in planning an irrigated farm, finds John D. Woods, SCS research, Denver, Colo. A soils map which designates the type of soil to be encountered to a depth of 3 or 4 feet, or beyond the root zone of most plants is also a requisite. With the aid of the topographic and soils map it is possible to classify the land as to future use That is, whether it should be in permanent pasture or grass, planted to row crops 1 year in 5 and close-growing crops the rest of the time, or whether it should be used in any desirable way without erosion and waste of water. These two maps will also show which fields need to have the surface leveled in order that the water can be effectively applied.

SUBTILLAGE AND CROP RESIDUES.—Subtilled land protected by crop residues proved to be superior to plowed

land in conserving soil and water and producing high yields of crops, states F. L. Duley, SCS research, Lincoln, Nebr. Plowed land unprotected by crop residues lost an average of 2.5 times as much run-off and 4.7 times as much soil annually as subtilled land protected by crop residue. Oats produced 61.6 bushels per acre with residues subtilled following 2 years of sweetclover compared with 54.8 where the residues were plowed under. Corresponding innreases in yields were obtained with wheat, corn, and pink kaffir.

EROSION AND CROP YIELDS.—Severely eroded soil loses more water and produces lower yields of crops than moderately eroded soil, report C. E. Bay, H. B. Atkinson, and O. E. Hays, SCS research, La Crosse, Wis. Plots with only 3 inches of topsoil lost 45 percent more soil and water than plots with 6 inches of topsoil. The moderately eroded plots produced 29 bushels more corn per acre, 9 bushels more small grain and 0.3 ton more hay than severely eroded plots, during the period 1940–42, where a 5-year rotation of corn, small grain, and 3 years of alfalfa-broome hay was used. During this same period moderately eroded soil planted to corn lost 19.05 tons of soil per acre annually and severely eroded soil lost 20.94 tons. Corresponding figures for small grain were 21.61 and 39.49 tons per acre and 0.18 and 0.57 ton soil per acre when planted to hay.

RUNOFF AND SEDIMENTATION.—The magnitude of sediment damages resulting from soil erosion and watershed deterioration is just beginning to be recognized, according to Carl B. Brown, SCS research, Washington, D. C. The storms of May and June 1947 caused an estimated damage of $1,402,000,000 in the lower Missouri River Basin. The agricultural land damages amounted to $720,000,000; crop losses on overflowed bottomlands amounted to $40,000,000; crop losses from rain, wind, and runoff on uplands amounted to $100,000,000; land damage by streambank cutting and major gully development was $4,000,000; damage to bottomlands by flood-plain scour and sediment deposits was $134,000,000; and land damage to uplands by sheet erosion on the basis of $1 per ton of soil lost from tillable land, was $424,000,000.

FERTILIZER EFFICIENCY.—That cropping and cultural practices which result in sheet erosion rapidly lead to inefficient use of fertilizer, is the belief of John Lamb, Jr., Everett A. Carlson, and George R. Free, SCS research, Ithaca, N. Y. The yield of corn in 1947 varied from 17 to 75 bushels per acre, depending on the previous cropping system and resultant erosion. All plots were uniformly fertilized at the rate of 1,000 pounds per acre with 10–10–10 fertilizer. The study was in its eleventh year.

SAVE THAT SOIL.—Continuous corn plots on Marshall loam lost 38.2 tons of soil per acre annually over a period of 16 years, states G. M. Browning, SCS research, Ames, Iowa. This is equivalent to one-third inch of topsoil per year. Corresponding losses for a 3-year rotation of corn-oats-meadow was 9.6 tons, with 18.4 tons for the years in corn, 10.1 tons for the years in oats and 2 tons for the years in meadow. Where an additional year of corn was added to the rotation the average annual loss of soil per acre increased to 14 tons. Continuous alfalfa plots lost an average of .1 ton of soil annually and continuous bluegrass plots lost .03 ton.

Contour cultivation reduced soil losses by 50 to 80 percent and increased the yield of corn 7.3 bushels per acre, soybeans 2.7 bushels and oats 5.4 bushels. Terracing and the use of crop residues and grassed waterways were also effective in reducing soil losses by erosion.

BRUSH REMOVAL AND GRASS.—Grass production was increased more than 5 times by removing dense growth of oak brush, and beef production was doubled by mowing sagebrush, reports M. B. Cox, SCS research, Guthrie, Okla. Farmers who cleared wood pastures claim increases in return from 5- to 8-fold. The production of native pecans was greatly increased by removing the underbrush and other species of trees.

SAND LOVEGRASS.—Native stand lovegrass has proved to be one of the most valuable and useful grasses for Oklahoma, according to Harley A. Daniel, SCS research, Guthrie. It is adapted to soils ranging from very sandy to fairly heavy. It is a lush-growing, fine-stemmed, medium-tall bunch grass with a rich growth of soft basal leaves. It is one of the best grasses for the Great Plains in year-long grazing value. It provides good yields of highly palatable and nutritious forage from early April to late October and has ability to retain in its winter-cured condition a large percentage of the high food value it possesses during the growing season.

SUMMER FALLOW.—Summer fallow can be safely and profitably practiced within its climatic limitations where good crop residue management is combined with it, is the belief of H. H. Finnell, SCS research, Amarillo, Tex. The one exception is the arid marginal zone, where crop failure, with or without summer fallow is sometimes so persistent that crop residues disappear in spite of the farmer's efforts to the contrary.

PINE-TREE GROWTH.—Room for root development in the surface soil and the physical properties of the subsoil which determine moisture availability and areation are of primary importance in determining the quality of land for pine forests, reports T. S. Coile, Duke University. Depth of the surface soil and the water-storage capacity of the subsoil are the main characteristics determining the ability of soil to grow loblolly and shortleaf pine. Using this as a basis the potential productive capacity of land for pine forests can be estimated.

PRODUCTION INCREASES.—Farmers cooperating with the Soil Conservation Service are making a notable contribution to the Nation's "all-out" effort for greater food production, says H. O. Anderson, SCS research, La Crosse, Wis. A La Crosse County farmer, who has been following soil conservation practices on his farm since 1934, increased his production of livestock by about 40 percent, butterfat

production by 50 percent, and egg production by about 30 percent during the past 9 years. These accomplishments are all the more noteworthy because the farmer operates one of the roughest farms in the county.

KENTUCKY "DERBY" WINNERS.—The highest average yield of any group of entrants in the 1947 "Corn Derby" as far as land use is concerned was for those who planted their corn on tile-drained land. The 70 farmers who planted their derby plots on tile-drained bottom land had an average of 98.8 bushels an acre which is 12 bushels above the average yield of the 1,125 farmers in the contest.

16TH CENTURY WISDOM.—"I do not wish to go into any more detail on all of the beauties and benefits of the woodlands and orchards. More than anything, I would like to enjoy them in my old age, if God pleases (and there isn't any one who does not hope to reach old age) while in your youth you must work and put out all of your effort and not seek rest and repose; as Tulio says—the elders repose and rest with the trees that they planted as youths. They should not wait to sow when old, for those that plant trees then, are like those who marry in their old age and leave little children and orphans. I do not say that, because they are old, they should stop planting, although they may not be able to enjoy them. Moreover there are none, however elderly they may be, that do not hope to live out their life, yet some never begin to do so. It is foolery to hope to live and not work continually to maintain life, moreover the enjoyment of the forests so saintly, so agreeable and sporting requires so little work, that it could not be less, and so beneficial that a good act of planting a tree profits the present and future, and as long as the tree lives it tells of that good act.

"Those that sow the fields only help themselves and a little after them; he who works profits by it, and little thanks to those who just work for themselves, or at the most for their children; it is better to plant trees for the children and grandchildren and future generations; and like others who plant for us, and we enjoy their efforts, a just thing is that we plant for us and for the ones that will follow us. Well it would be good if each one would try to plant and grow trees. The most productable age of a tree, according to agriculturists is from twenty to thirty-five years of age. Since a man knows how to do things before he is so old he can no longer stand, it would be good that he plant and grow trees, without waiting too long. How many in their old age, have grown trees and that have not waited to see the fruit and received pleasure from them, and how many twenty years of age have received pleasure from trees that they planted when children!

"Likewise, it is said, that first plant the tree and then build the house, because the forests will help to make the house and not the house the forests. It appears to me that whomsoever would want to have a house in which to live, and have the forest to make him rich, will be able to build better, and that is my understanding of what they say."

(Taken from the book by Gabriel Alonso de Herrera "Book of Agriculture—Farming, Livestock, and many other subjects and benefits of the farm", Alcalá, year 1513. Translated from Spanish by Adela R. Lopez, Office of the Foreign Liaison Representative, SCS).

COVER CROPS PROTECT.—Whether you call it a green manure crop, a catch crop, or a winter cover crop, the practice is a good one and is essential to good soil conservation management, states Karol J. Kucinski, SCS Research, Amherst, Mass. Whatever the name, cover crops produce desirable vegetative growth on crop land which protects the surface from both water and wind erosion. Cover crops also catch the unused fertilizer which remains in the soil after the main crop has been harvested. Farmers, in order to obtain good yields, apply considerably more fertilizer than is used up by the harvested crop. Cover crops, or catch crops, while preventing soil erosion, will stop these excess plant nutrients from leaching out and save them for the succeeding crop, and at the same time will add desirable organic matter to the soil.

TRIPLE BENEFIT.—It is possible to increase the yield of cotton, to check erosion, and to improve the soil at the same time, by growing a crop in good soil-conserving and soil-improving rotations, avers W. E. Adams, SCS Research, Watkinsville, Ga. The rotation needs close-growing summer cover crops, which protect the land against erosion and supply leguminous residues to the soil. The soil is made more fertile, more mellow and absorptive, less erodible, and easier to manage by addition of organic matter.

STOCKING FARM PONDS.—Farm ponds should be stocked with bluegills and bass, states Wallace L. Anderson, SCS, Milwaukee, Wis. Bluegills and bass make a combination that will consistently and indefinitely produce good fishing and high production. They must be stocked in combination because neither species alone is satisfactory.

The number of each of these species used in stocking should be determined by the carrying capacity of the pond. Each pond will support a certain weight of fish per acre, and the best fishing is produced when just enough fish are stocked in the pond to reach that weight in one year. A highly fertile pond has a larger carrying capacity and can be stocked with more fish than an unfertile one.

Stocking with fingerling bluegills and bass in the fall, or fingerling bluegills in the fall, followed by advanced bass fry the next spring, is the only procedure that gives consistently good results.

RATE OF RESERVOIR SILTING.—The rate of silting of a reservoir depends upon its capacity, the quantity and nature of sediment delivered to it, and its ability to retain sediment, alleges L. C. Gottschalk, SCS Research, Washington, D. C. Some watersheds produce an abundance of sediment while others, of equal size, do not. In some cases, sediment remains in suspension for long periods of time and is carried through the reservoir and over the spillway. In others, it may be deposited almost immediately near the head of the reservoir. Some sediment

Talking over the honors: Parshall, "Molly", Chief, Hull, Jones.

Wells A Hutchins receives award from Norris E. Dodd, then Under Secretary.

HONORS FOR FIVE.—At its second annual Honor Awards Ceremony in the Sylvan Theater, on the grounds of the Washington Monument in the Capital, the United States Department of Agriculture showed its "appreciation for the talented, efficient, reliable work of outstanding public servants." Five employees of the Soil Conservation Service were presented Superior Service Awards, with appropriate medals and citations:

William X Hull, Washington, D. C., "For outstanding service to agriculture in having spread the gospel of soil conservation through developing and coordinating a program whereby outstanding representatives of foreign nations have been trained in soil conservation so that they might return to their native lands and develop soil conservation programs."

Wells A. Hutchins, Berkeley, Calif., "For especially meritorious service to agriculture in the Western United States and the Territory of Hawaii in codifying and clarifying western water laws and simplifying regulations affecting the delivery and use of water by irrigators."

Lewis A. Jones, Washington, D. C., "For especially meritorious service to agriculture through his leadership and efforts in the drainage and reclamation of wet, swamp, and malaria-infested lands and the conservation, use, and management of water resources."

Remo Molinaroli, Kingstree, S. C., "For outstanding leadership in helping to develop a sound soil-conservation program and particularly for his efforts in developing a widespread interest and adoption of drainage and irrigation practices in an area where such practices had not been prevalent."

Ralph L. Parshall, Ft. Collins, Colo., "For perfecting and introducing simple, economical, and effective water-measuring and desilting devices used extensively in irrigation systems in the United States and foreign countries."

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deposits compact readily, whereas others compact slowly. Reservoirs of equal size but of different use may trap sediment at different rates.

ON THIN SOILS.—Erosion control can be obtained on erodible lands if they are placed under permanent cover of grass or forest, according to J. B. Pope and P. R. Johnson, SCS Research, Tyler, Tex. Sloping, intensively cultivated fields, on the other hand, require not only the use of improved rotations and protective winter cover crops but the additional support of mechanical practices such as contour cultivation and terraces. Subsoils erode more readily than the normal topsoils where planted to clean-tilled crops. As the soil becomes thinner the rate of erosion increases. This indicates the need for more intense erosion control measures on the thinner soils.

CUTTING DOWN SEDIMENT.—The rate of sediment production can be reduced at least 50 percent and in many cases from 75 to 90 percent by universal application of practicable soil conservation measures, without reducing the level of agricultural production or net farm income, claims Carl B. Brown, SCS Research, Washington, D. C. This degree of reduction, however, is contingent upon practically unanimous cooperation of landowners and operators in use of the land in accordance with its capabilities and treatment of the land in accordance with its needs.

THANK *YOU!*—In a recent letter referring to SOIL CONSERVATION Magazine, Paulina Gomez-Vega, Ministerio de Minas y Petroleos, Bogota, Colombia, writes: "I must thank you for the great help I have had by your publication in controlling erosion in a 55 acres farm I have at present, as a demonstration, in one of the most eroded regions of Colombia."

From left: Harry A. Gunning, A. E. Jones, Richard P. White, Hugh Bennett.

CAPITAL PROTECTED.—Conservation planning of commercial nurseries has been stimulated greatly by the interest of the American Association of Nurserymen. Dr. Richard P. White, permanent secretary of this very active association, is an agriculturalist of note in his own right. Formerly with Rutgers University of New Jersey, Dr. White gained national recognition as an authority on ornamental plant diseases. His broad knowledge and experience in the technical field of agriculture have been advantageously used in his association work.

He has been interested in soil conservation and has been a friend and constructive critic of the Soil Conservation Service from the beginning.

The commercial nursery business of the United States is big business. It involves large acreages of land and very great capital outlays. Productive soil is the nurseryman's most valuable asset. It is his basic capital investment. As such, it cannot be allowed to deteriorate in productivity or to erode away.

Dr. White and his associates are fully aware of this situation and the impending dangers to the industry for which they are responsible. They have observed the rise and fall of highly respected commercial nursery enterprises, are able to trace these failures to continuous cropping of land, to the resultant loss in soil fertility, and to soil erosion. They realize that something must be done to bring this forcibly to the attention of those concerned.

Commercial nurseries, while highly specialized enterprises, require much the same sort of soil conservation program as do farms. Consequently, a considerable number of nurseries have been planned by the Service during the past few years. Several of these have been observed and studied by Dr. White and conservation's importance to the business fully appreciated. The Service was invited to provide a speaker on the subject of conservation planning in commercial nurseries at the National meeting of the American Association of Nurserymen, held in Boston, Mass., in July 1947. A. D. Slavin, chief, regional nursery division of the Milwaukee, Wis., office of the Service, was selected as the man to do the job.

Slavin's talk was enthusiastically received and created a great deal of interest among attending nurserymen. Slavin gave similar talks at several meetings of affiliated State associations during the winter of 1947–48. In the spring of 1948 the Service was asked to assist in preparing a bulletin which would be gotten out by the American Association of Nurserymen, primarily for members' use and information. Again, Slavin was drafted.

The result is a bulletin which would be a credit to any organization. Written for the layman and admittedly incomplete from a technical viewpoint, it is at the present time the most complete publication available on its subject. Unlike most bulletin material based on previously published technical material, it includes in one package not only popular information but also an original presentation of soil conservation planning techniques adapted to the specialized field of nursery work.—HARRY A. GUNNING.

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